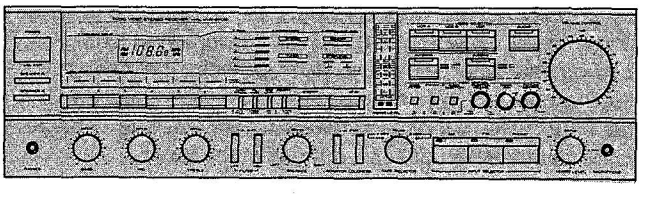
AUDIO VIDEO STEREO RECEIVER

KVR-970B

INSTRUCTION MANUAL



KENWOOD

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Introduction

The purpose of this manual is to acquaint you with the operating features of your new audio video stereo receiver. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.
We suggest that you read this manual carefully. Knowing how to set up your receiver to the best advantage will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your receiver to meet your special requirements.

For your records

Record the serial number, found on the back of the unit, in the spaces designated on the warranty card, and in the space provided below. Refer to the model and serial numbers whenever you call upon your dealer for infomatin or service on this product.
Model KVR-970B Serial number _____

After unpacking

After unpacking, we recommend that you inspect the unit for any possible shipping damage. If your unit is damaged or fails to operate, notify your dealer immediately. If your unit was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the unit) can file a claim against the carrier for shipping damage. We recommend that you retain the original carton and packing materials to prevent any damage should you transport or ship your unit in the future.

Important!

U.S.A. and Canada

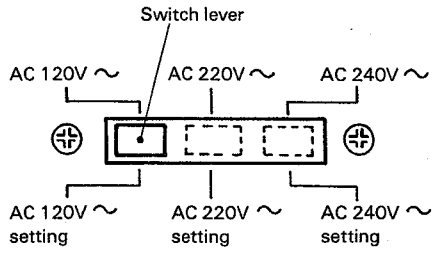
Units shipped to the U.S.A. and Canada are designed for operation on 120 volts AC only.
These units are not equipped with an AC Voltage Selector switch and the discussion of such a switch that follows should be disregarded.

All other countries

Units shipped to countries other than the U.S.A. and Canada are equipped with an AC Voltage Selector switch on the rear panel.
Refer to the following paragraph for the proper setting of this switch.

AC voltage selection

This unit operates on 120 volts, 220 volts or 240 volts AC. The AC Voltage Selector switch on the rear panel is set to the voltage that prevails in the area to which the unit is shipped. Before connecting the power cord to your AC outlet, make sure that the setting position of this switch matches your line voltage. If not, it must be set to your voltage in accordance with the following direction.



Move switch lever to match your line voltage.

AC voltage selector switch

Note:
Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector switch.

WARNING:

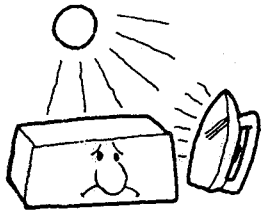
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
	The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.
	The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

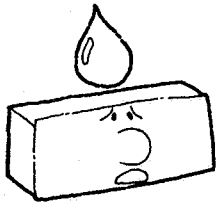
Before operation

Notes on installation

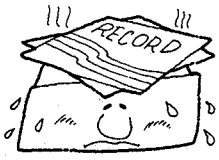
Do not place the unit in a place which is exposed to direct sunlight, near a heating appliance, etc.



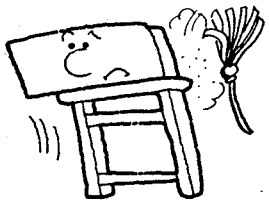
Do not place a vase containing water, makeup, etc. on the unit. Do not use in a humid place.



To maintain good ventilation, do not put records or a tablecloth on the unit. Place the unit at least 10 cm away from the walls.



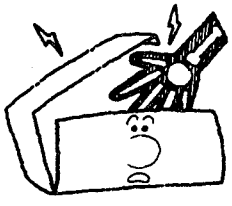
Choose a location that is relatively free from vibration or excessive dust.



- Do not place a video tape deck on top of the KVR-970B the deck may be damaged by a heat from this unit.
- When operating two or more video decks, do not place the video decks close each other, or video and audio signals may be deteriorated.
- When a video deck is used in a vicinity of a TV set or receiver, the audio signal may be interfered with magnetic field generated from TV set. This causes noise in the audio signal and stripes on the picture. In this case, place the video deck away from the TV set.

Safety precautions

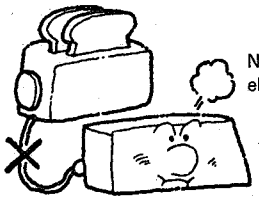
Never remove the case. If the internal parts are touched accidentally, a serious electric shock might occur.



Never touch internal parts.

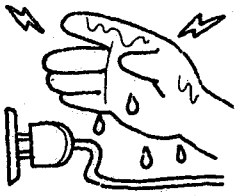
If a metal object, such as a hair pin or a needle, comes into contact with the power socket on the rear panel, a dangerous electric shock may result. For families with children, never permit children to put anything, especially metal, inside this unit.

Do not connect other audio equipment with a power consumption larger than that specified to the AC outlet on the rear panel. Never connect other electrical appliances, such as an iron or toaster.



Never connect other electrical appliances.

Touching the power plug when your hands are wet may result in a serious electric shock.



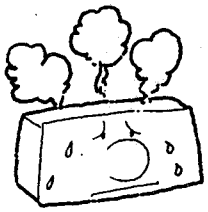
Never touch with wet hands.

Never pull, bend or extend the power cord. This could damage the power cord, resulting in a broken cord or short-circuit.

Always grasp the plug.

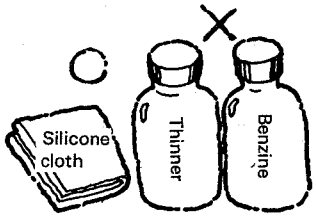
In case of abnormal smell

If an abnormal smell or smoke is detected, immediately turn the power OFF and pull out the power cord. Contact your dealer or nearest Service Station.

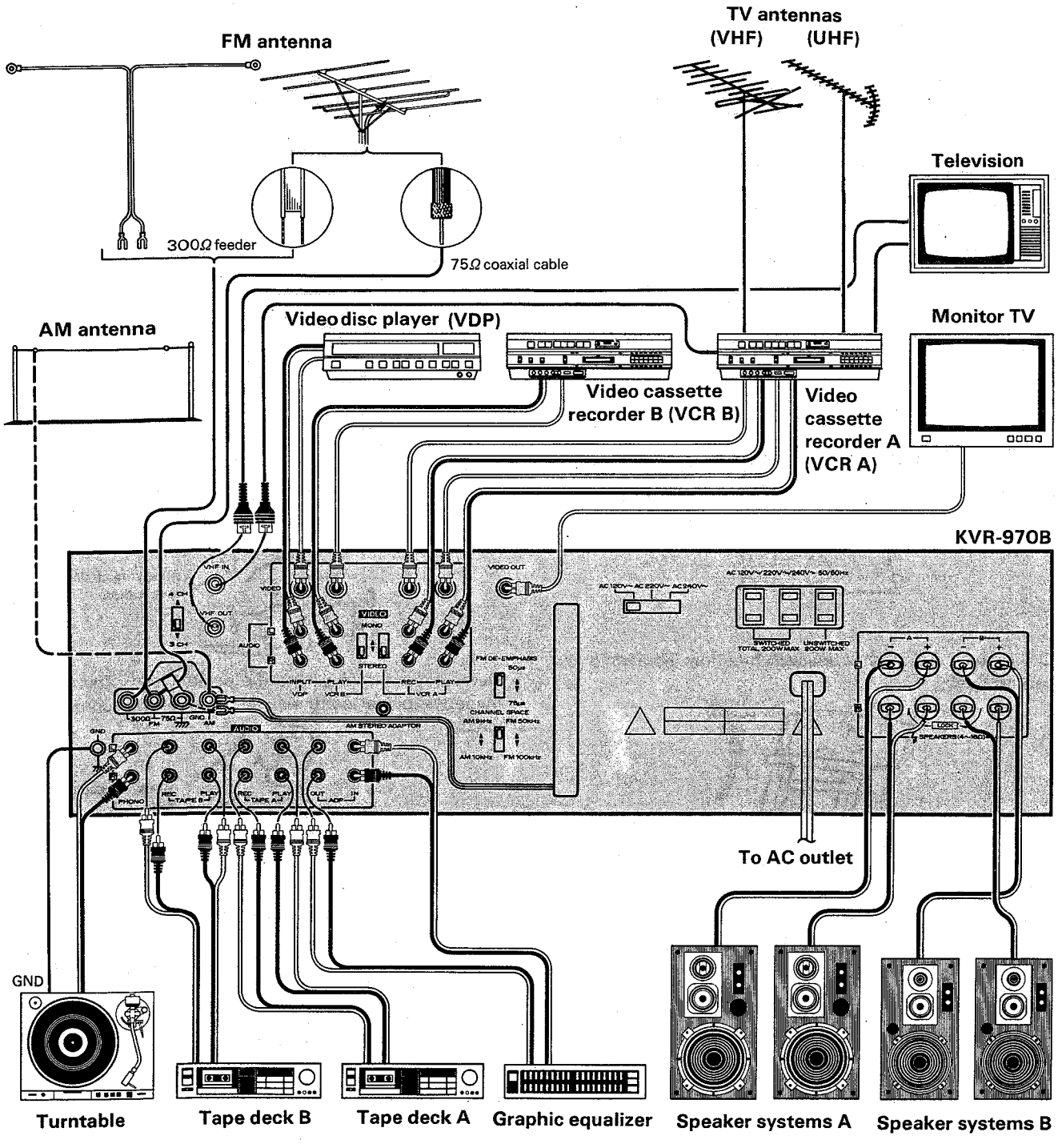


Cleaning

Do not use volatile solvents such as alcohol, paint thinner, gasoline, benzine, etc. to clean the cabinet.
Use a silicone cloth or a clean dry cloth.



System connections



Connection of video decks

This unit is equipped with the VCR A and VCR B jacks for connection of two video tape decks. The video deck connected to the VCR A jacks can be used for playback and recording. The video deck connected to the VCR B jacks can only be used for playback.

● VCR A jacks (PLAY/REC)

Video-path connection:

Recording – Connect the VIDEO REC jack of this unit and the video input jack of a video deck (VCR A) with an audio cable.

Playback – Connect the VIDEO PLAY jack of this unit and the video output jack of the video deck (VCR A) with an audio cable.

Audio-path connection:

Recording – Connect the AUDIO REC jacks of this unit and the audio input jacks of the video deck (VCR A) with an audio cable.

Playback – Connect the AUDIO PLAY jacks of this unit and the audio output jacks of the video deck (VCR A) with an audio cable.

● VCR B jacks (playback only)

Video-path connection:

Playback – Connect the VIDEO PLAY jack of this unit and the video output jack of a video deck (VCR B) with an audio cable.

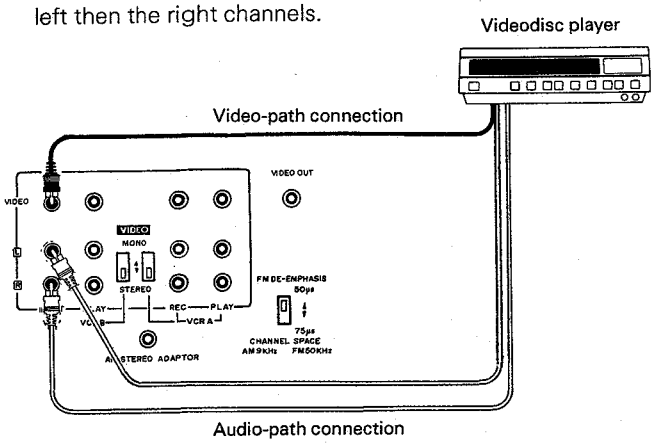
Audio-path connection:

Playback – Connect the AUDIO PLAY jacks of this unit and the audio output jacks of the video deck (VCR B) with an audio cable.

Connection of videodisc player

Video-path – Connect the VDP VIDEO jack of this unit and the video output jack of the videodisc player with an audio cable.

Audio-path – Connect the VDP AUDIO jacks of this unit and the audio output jacks of the videodisc player with an audio cable. To prevent cross connection, connect the left then the right channels.

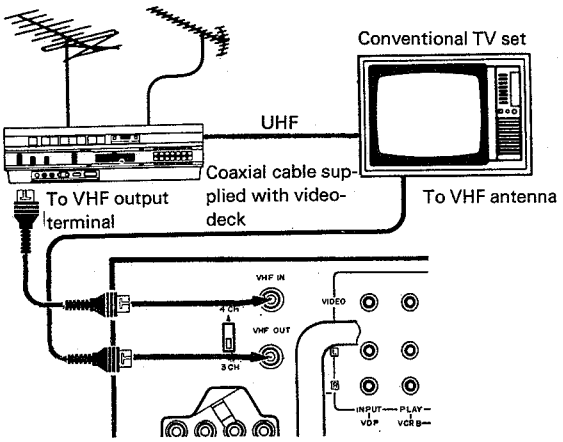


Videodisc connection

Connection of TV sets

● With conventional TV sets (having no video input jack)

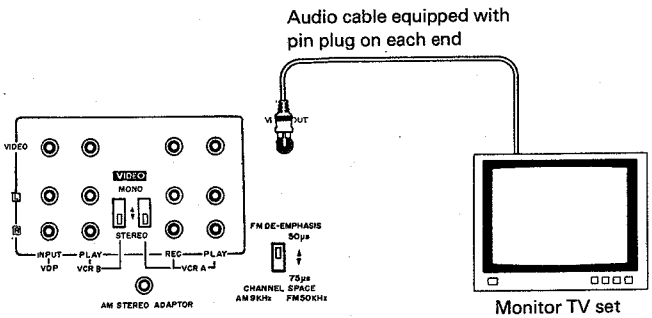
1. Connect the VHF out terminal of the video deck connected to the VCR A jacks and the VHF IN terminal of this unit with the supplied coaxial cable.
2. Connect the VHF OUT terminal of this unit and the VHF antenna input terminal of the TV set with the coaxial cable supplied with the video deck.
3. Connect the UHF antenna input terminal of the TV set and the UHF antenna output terminal of the video deck with a UHF ribboned feeder lead. For proper connection, consult the Instruction Manual of your video deck.



Using conventional TV set

● With monitor TV or conventional TV equipped with the video input jack

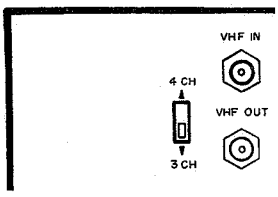
As shown in figure below connect the VIDEO OUT jack of this unit and the video input jack of the TV set with an audio cable.



Monitor TV connection

RF converter setting

The built-in RF converter converts signals played back from video equipment connected to the KVR-970B into signals used in TV broadcasting. The converted signal is transmitted to the vacant channel of the TV set connected to the KVR-970B for video reproduction. For this purpose, set the RF converter switch to the vacant channel, 3 or 4, according to your location.



RF converter setting

Speakers

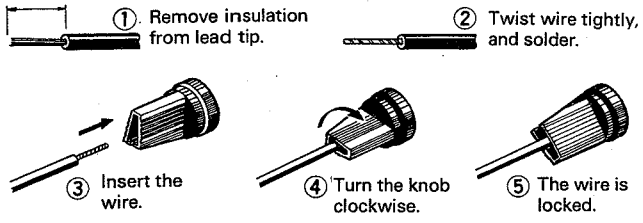
Connect a set of speakers to the [L] and [R] terminals in accordance with the location selected for each speaker. To ensure correct speaker phasing, observe polarity marks; connect terminals marked (+) on the receiver to similarly-marked speaker terminals. Do the same for receiver and speaker terminals marked with a minus sign. Reversal of speaker leads will result in loss of bass tones and poor stereo separation.

It is recommended that the tips of the speaker leads be soldered, or the strands of individual leads be twisted together to eliminate any possibility of short-circuits forming in the speaker connecting network.

Similarly connect a second set of speakers to the SPEAKERS B terminals.

Note:

Each speaker to be connected must be rated at four ohms or more.



Speaker lead connection

Tape decks

If only one tape deck is to be connected to the system it is recommended that it be connected to the jacks marked TAPE A.

Tape deck input and output cables are normally terminated with phono plugs.

Playback – Plug the left and right output cables of the tape deck into the [L] and [R] TAPE A PLAY jacks.

Record – Plug the left and right input cables of the tape deck into the [L] and [R] TAPE A REC jacks.

Second tape deck

Plug the input and output cables from the second tape deck into the REC and PLAY jacks marked TAPE B.

Turntables

Your stereo turntable has two audio cables that are terminated with phono plugs. Plug the left channel plug into the [L] and the right channel plug into the [R] PHONO input jacks. If the turntable has a ground wire, connect it to this unit's GND terminal to avoid hum.

Ground

For maximum safety and minimum interference connect the GND terminal to a good earth ground if practicable. A good earth ground is a cold water pipe or a metal stake driven into moist earth. However, never use a gas pipe for this purpose.

ADP (ADAPTOR) jacks

These jacks are for connection of a graphic equalizer or reverberation unit and controlled by the ADAPTOR switch on the front panel.

With these jacks, preamplifier and main amplifier sections can be separated.

AM STEREO ADAPTOR jack

In the U.S.A. AM broadcasts are considered to be operated in stereo in near future. Considered to this potentiality this unit employs the AM STEREO ADAPTOR jack to serve that operation.

To operate an AM stereo reception connect a commercially available adaptor to this jack.

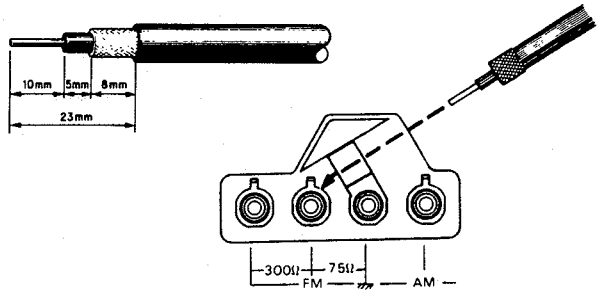
FM antennas

FM outdoor antenna

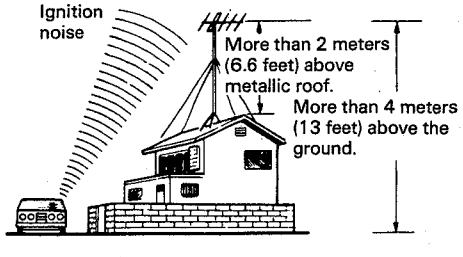
Consult with your dealer or service man about the best method of selecting and erecting an outdoor FM antenna. The choice of lead-in (feeder) wire is also important. The flat ribbon-shaped twin lead performs well electrically, is cheaper and is somewhat easier to handle in routing through windows and around rooms. Coaxial cable is more expensive, does a much better job of minimizing interference, is less prone to the effects of weather and close-by metal objects, and is nearly as good a signal conductor as the ribbon type wire. The latter is particularly true of foam-type coaxial cables. Coaxial cable is somewhat more difficult to install at the point where the cable enters the building. If coaxial cable is selected, make sure the antenna is designed to drive that type of cable.

Note:

Do not make connections to 300Ω and 75Ω antenna terminals simultaneously.



75Ω coaxial cable connection



- To minimize auto-ignition noise, locate the antenna as far from heavy traffic as possible.
- Keep the feeder or coaxial cable as short as possible. Do not bundle or roll up excess cable.
- The antenna should be at least two meters (6.6 feet) from reinforced concrete walls, or metal structures.

FM outdoor antenna installation

FM indoor

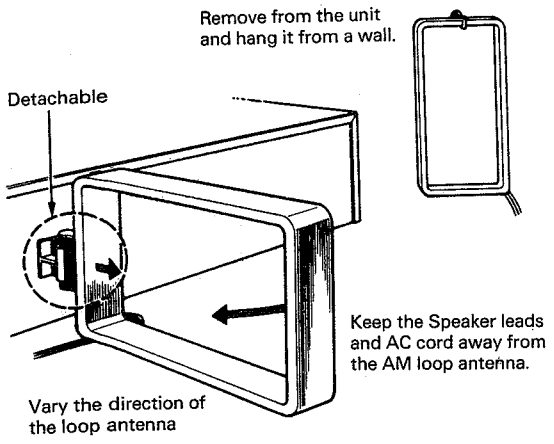
Connect the T-shaped indoor antenna (supplied) to the 300Ω FM ANTENNA terminals. Spread the two arms that form the top of the "T" horizontally and hold them against convenient wall surfaces. Try several locations for best results on your favorite stations. Tape the antenna in place where the best compromise is found between listening results and appearance.

AM antennas

AM loop antenna

Tune to your favorite AM station and position the Loop antenna for best reception. Try other stations and find the position that gives best overall reception.

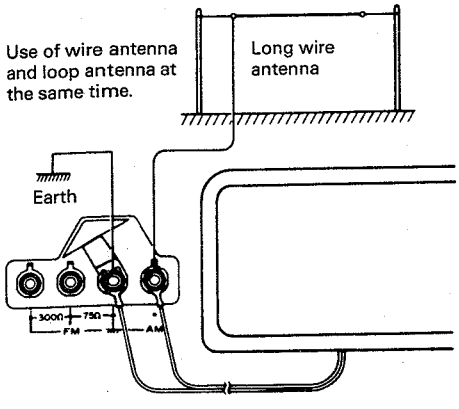
When this unit is mounted in a rack or placed on a shelf with insufficient space behind, remove the loop antenna and hang if from a wall in the direction which gives best reception as shown below. If the length of the lead wire is too short, add a lead wire of an appropriate length.



AM loop antenna setting

AM outdoor Antenna

In concrete buildings or at a great distance from the transmitter, it may be necessary to install and outdoor wire antenna. The end of this wire should be stripped of insulation and connected to the AM terminal as shown below.



AM antenna connection

AC Outlets

The AC outlets on the rear panel of the unit may be used to supply power to other components such as a turntable, tape deck, etc. Never connect any equipment here whose power consumption exceeds the capacity of each outlet.

SWITCHED outlet – This is 200 watts maximum in total capacity and is controlled by the POWER switch and timer

UNSWITCHED outlet – This is 200 watts maximum in capacity and power is available at all times.

FM DE-EMPHASIS switch

Before shipment this switch has been preset to the appropriate position for the expected delivery area.

An incorrect setting will adversely affect high frequency response, so check for a correct setting before putting the unit into operation.

U.S. military and other countries ..... 75 μs
Oceania and Europe ..... 50 μs

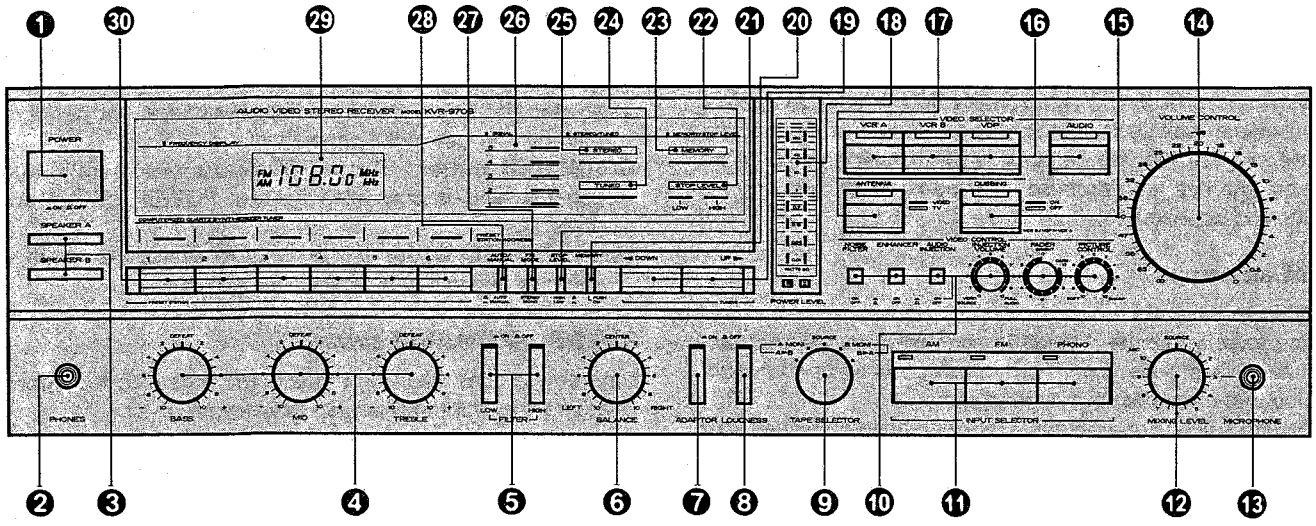
CHANNEL SPACE switch

The CHANNEL SPACE switch on the rear panel is set to the correct setting that prevails in the area to which the unit is shipped. However, if the channel space setting is not matched to the area where the receiver is to be used; for instance, when you moved from area 1 to area 2 or vice versa, desired reception of FM/AM broadcasts is not expected. In this case, change the CHANNEL SPACE setting in accordance with the area corresponding to the table shown below.

Area	Channel Space Frq.	
1 U.S.A., Canada Hawaii, and Guam	**FM:** **AM:**	100 kHz 10 kHz
2 European countries Far East countries	**FM:** **AM:**	50 kHz 9 kHz

Channel Space Table

Controls, indicators and connectors



❶ POWER switch
Press in to turn on power. Press it again to turn power off.

❷ PHONES jack
Stereo headphones are plugged into this jack. When SPEAKER A and SPEAKER B switches are set to OFF, only headphones can be heard.

❸ SPEAKER A and SPEAKER B switches
A ON – Activates speakers connected to the SPEAKERS A terminals on the rear panel.
B ON – Activates speakers connected to the SPEAKERS B terminals on the rear panel.
A, B ON – Activates speakers conneced to the SPEAKERS A and SPEAKERS B terminals simultaneously.

Note:
When the SPEAKER A and SPEAKER B switches are used at the same time, the speakers connected to the SPEAKERS A and SPEAKERS B terminals are connected in series. In this respect, whenever using the SPEAKER A and SPEAKER B switches at the same time, be sure that two pairs of speakers are connected to the terminals A and B, otherwise no sound is output.

❹ BASS, MID and TREBLE tone controls
Turn clockwise to increase bass, middle or treble response, counterclockwise to reduce bass, middle or treble response.
Response is flat when set to "DEFEAT".

❺ FILTER switches
HIGH – Press to ON to reduce signal levels above 5 kHz at the rate of 6 dB per octave. Press again to switch off the high frequency filter.
LOW – Press to ON to reduce turntable rumble or the effects of warped records. Press again to switch off the low frequency filter.

❻ BALANCE control
This control permits balancing of left and right channels when an imbalance exists in the sound source, or to correct acoustic imbalance due to room conditions.
When the right channel is weaker than the left channel, turn the control to the right. When the left is weaker than the right, turn it to the left.

❼ ADAPTOR switch
This switch enables operation of the unit connected between the ADAPTOR's OUT-IN jacks on the rear panel.

❽ LOUDNESS switch
This switch boosts bass response to compensate for the lack of response in human hearing to those frequencies at low volume levels. This switch should be switched off when listening at normal and high levels.

❾ TAPE SELECTOR
SOURCE – The signal applied to the record terminals of a tape deck is heard.
A MONI – To monitor a recording in progress or to play back a tape from a tape deck connected to the TAPE A jacks.
B MONI –To monitor a recording in progress or to play back a tape from a tape deck connected to the TAPE B jacks.
A ▶ B – When dubbing from the tape deck connected to the TAPE A jacks to the tape deck connected to the TAPE B jacks.
B ▶ A – When dubbing from the tape deck connected to the TAPE B jacks to the tape deck connected to the TAPE A jacks.

Notes:
1. Be sure to set the TAPE SELECTOR to SOURCE when not operating a tape deck.
2. During tape dubbing, do not change the TAPE SELECTOR setting.

❿ VIDEO CONTROLs
NOISE FILTER – Setting this switch to ON reduces the noise component in the frequency range of more than 3.5 kHz of a video tape. This feature functions even during video dubbing.
ENHANCER – Setting this switch to ON converts a monaural source signal into a pseudostereo.

Notes:
1. Ensure that the switch is set to OFF when stereo source is to be played.
2. Do not press the switch when listening to TV or recording onto VCR A in the mono mode.

AUDIO INJECTION – Used to insert the required audio signal into the sound track of a video tape on the video deck connected to the VCR A jacks. The audio signals are selected with the INPUT SELECTOR or TAPE SELECTOR. With this system, you can prepare your tape personal.
INJECTION VOLUME – This control adjusts audio signals to be inserted to the video tape. Set it to the desired level.
FADER – With this control, both sound and picture can be faded out. It is very useful for editing video tapes. For normal operation, set to BRIGHT.

Note:
For some program source, the picture may not be faded out.

PICTURE CONTROL – Used to adjust picture quality. At the center, there is a click position which provides the original picture quality. Turning clockwise increases the clarity of the picture; turning counterclockwise decreases it.

Notes:
1. When a video tape is recorded or played back with the PICTURE CONTROL turned all the way to SHARP visual noise may be recorded on the video tape or seen on the TV screen.
   In this case, turn the control counterclockwise to eliminate it.
2. When dubbing is carried out with the PICTURE CONTROL set all the way to SOFT or SHARP, the video signal may not be recorded properly. In this case adjust the PICTURE CONTROL to the correct picture color.

⓫ INPUT SELECTORs

AM – This setting permits AM reception; the frequency display indicates the AM frequency in kHz.

FM – This setting permits FM reception; the frequency display indicates the FM frequency in MHz.

PHONO – This setting permits record playback.

⓬ MIXING LEVEL control

Used to adjust the mixing ratio of source and mic-input. Turning clockwise increases the mic-input level, and the source level will decrease as the mic level is raised.

Turning counterclockwise performs the oposite operation. Always set to SOURCE when a microphone is not in use, otherwise the source sound will be attenuated and may become totally inaudible.

⓭ MICROPHONE jack

Plug a 600-ohm to 50-kohm impedance microphone into this jack. Its output can be mixed with an audio signal of a video tape, a videodisc record, a radio broadcast, a record or an audio tape.

⓮ VOLUME CONTROL

This control adjusts left- and right-channel volume simultaneously. Set it for the desired listening level.

⓯ DUBBING switch

Press this switch to dub from a video deck connected to VCR B jacks, a videodisc player connected to VDP jacks or an audio source, to a video jack connected to VCR A jacks.

⓰ VIDEO SELECTORs

VCR A – Press this switch when playing back the video deck connected to VCR A jacks.

VCR B – Press this switch when playing back the video deck connected to VCR B jacks.

VDP – Press this switch when playing back the videodisc player connected to VDP jacks.

AUDIO – Press this switch when listening to an audio source, AM, FM or PHONO.

⓱ ANTENNA slector

Used to select the signals to be monitored on the TV screen.

VIDEO – Use this setting when playing back a video cassette recorder or videodisc player connected. In this setting the LED above the switch will light.

TV – Use this setting to watch TV programs while video dubbing is being carried out.

In normal use, set this switch to VIDEO. When POWER switch is turned off, the signal fed to the VHF IN terminal is transmitted directly to the TV set.

⓲ POWER LEVEL indicator

The POWER LEVEL indicator shows the effective power being delivered to your speakers. The indicators are calibrated for an 8-ohm load. If 4-ohm speakers are used, multiply the reading by 2; for 16-ohm speakers, divide the reading by 2.

⓳ TUNING switches

AUTO tuning – With the AUTO/MANUAL switch set to AUTO, pushing the DOWN (◀) switch shifts the tuning frequency indicated on the display downward automatically until a broadcast station is received; pushing the UP (▶) switch shifts the tuning frequency upward until a broadcast station is received.

MANUAL tuning – With the AUTO/MANUAL switch set to MANUAL, pushing the DOWN (◀) or UP (▶) switch momentarily decreases or increases the frequency by one step.

If the DOWN (◀) or UP (▶) switch is kept depressed, the frequency starts to decrease or increase rapidly.

⓴ MEMORY switch

The MEMORY switch is used to store the frequency in the memory. Press the MEMORY switch and the desired PRESET STATION switch within approx. 5 seconds, and the displayed frequency is stored in the memory.

㉑ STOP LEVEL switch

Used to change the threshold level of auto tuning.

HIGH – With this setting, only stations that are strong enough can be received by auto tuning.

LOW – With this setting, stations weaker than those received with the HIGH setting can be received.

㉒ STOP LEVEL indicator

Shows the STOP LEVEL switch setting.

㉓ MEMORY indicator

When the MEMORY switch is pressed, the indicator lights.

Press the PRESET STATION switch while this indicator lights to store the desired station.

㉔ TUNED indicator

Lights to show when an FM or AM station is received.

㉕ STEREO indicator

Lights to show that the selected FM channel is transmitting in stereo and that the signal is strong enough to overcome muting.

㉖ SIGNAL indicator

The 5-LED indicator lights to show the strength of incoming signal. The number of LEDs that light is proportional to the signal strength. Tune so that most LEDs light.

㉗ FM MODE switch

When the FM MODE switch is set to MONO, all FM broadcasts are received in monaural.

Set to STEREO position, stereo broadcasts are received in stereo, and monaural broadcasts are received in monaural.

When the receiver is in the auto tuning mode, only those stations whose signal strength is sufficiently strong for noise-free reception are selected.

When reception of weaker stations is desired, placing the receiver in the MONO mode will pick up those stations too weak for stereo reception.

㉘ AUTO/MANUAL switch

AUTO – This setting permits automatic AM/FM tuning by pushing the TUNING switches. This setting permits muting during the scan tuning.

MANUAL – This setting permits manual AM/FM tuning by pushing the TUNING switches.

㉙ FREQUENCY DISPLAY

The frequency being received is indicated by this digital display.

㉚ PRESET STATION switches

These switches are used to preset the frequencies of broadcasting stations. Each switch gives access to two memory sections, one for the FM band and the other for the AM band. As a result, one FM frequency and one AM frequency can be preset with one PRESET STATION switch. Selection between FM and AM is performed with the INPUT SELECTORs. With this preset funciton, preset tuning is available without pressing the TUNING switches.

Notes:

1. When the PRESET STATION switches are pressed to preset a new frequency, the old frequency is cleared and the new frequency is stored.
2. Do not press the MEMORY switch and PRESET STATION switches simultaneously.

Operating instructions

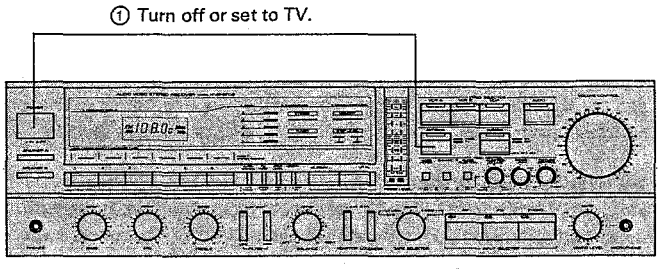
Video section

Before starting the following procedures, set the VCR A and VCR B switches as follows:

1. The input selectors of the VCR A and VCR B to VIDEO
2. The antenna selectors of the VCR A and VCR B to TV
3. If your VCR is not equipped with an input selector, connect the pin plugs to the correct jacks.

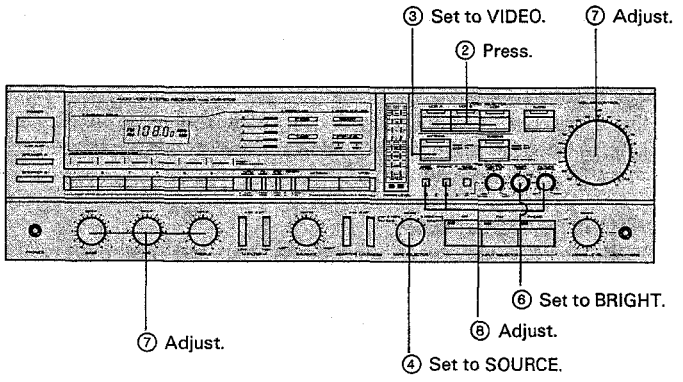
To watch a TV program

1. Set the ANTENNA selector to TV or turn the power of the receiver off.
2. Adjust the TV program selector to receive your favorite program.
3. Adjust the TV volume control.



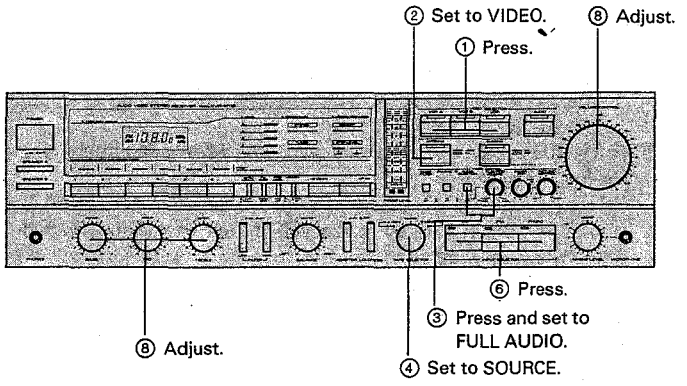
To watch a picture on TV and listen to the sound through the speakers

1. Set the TV program selector switch to a vacant channel, 3 or 4.
2. Press the VCR A, VCR B or VDP switch.
3. Set the ANTENNA selector to VIDEO.
4. Set the TAPE SELECTOR to SOURCE.
5. Operate the VCR A, VCR B or VDP. For further operation details, follow the VCR A, VCR B or VDP Instruction Manual.
6. Set the FADER control to BRIGHT.
7. Adjust the VOLUME CONTROL and BASS, MID and TREBLE tone controls as your preference.
8. Adjust VIDEO CONTROLs (NOISE FILTER, ENHANCER and PICTURE CONTROL) as your preference.



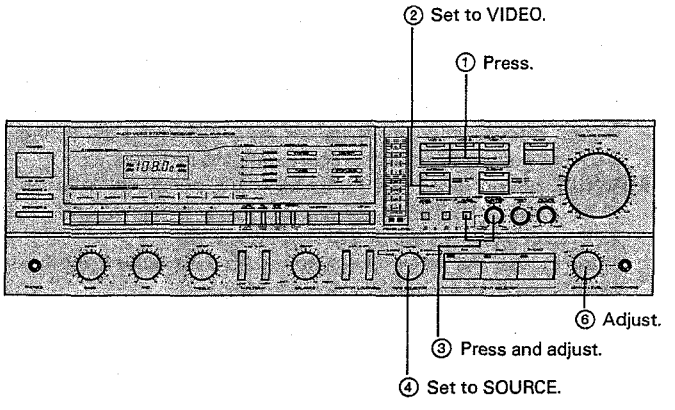
To watch the picture of video system while listening to the audio sound

1. Press the VCR A, VCR B or VDP switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the AUDIO INJECTION switch and set to INJECTION VOLUME to FULL AUDIO.
4. Set the TAPE SELECTOR to SOURCE.
5. To listen to tape sound, set the TAPE SELECTOR to MONI.
6. Press the FM, AM or PHONO switch.
7. Start playback of VCR A, VCR B or VDP and audio program source.
8. Adjust the VOLUME CONTROL and BASS, MID and TREBLE controls as your preference.
9. Adjust the VIDEO CONTROLs (FADER and PICTURE CONTROL) as your preference.



To listen to the video sound mixed with audio sound while watching the video picture

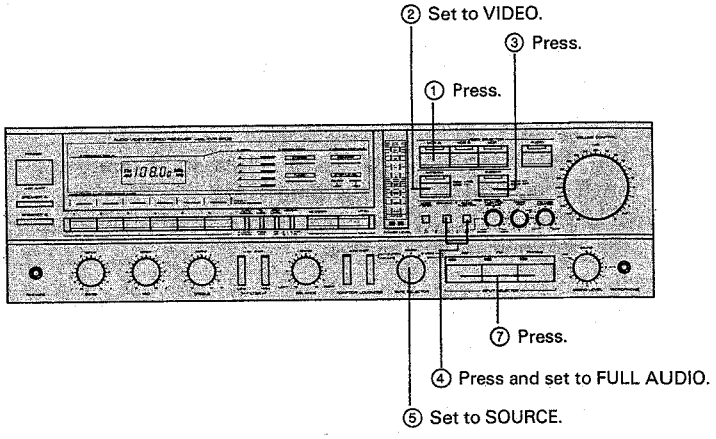
1. Press the VCR A, VCR B or VDP switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the AUDIO INJECTION switch and adjust the INJECTION VOLUME.
4. Set the TAPE SELECTOR to SOURCE.
5. Connect a microphone to the MICROPHONE jack and adjust the mixing level with the MIXING LEVEL control.
6. Press the AM, FM or PHONO switch and play the program source.
7. Set the video system to playback mode.
   The video sound mixed with the audio sound can be heard while watching the video picture.



To watch the picture of VCR A while recording audio program source to the VCR A

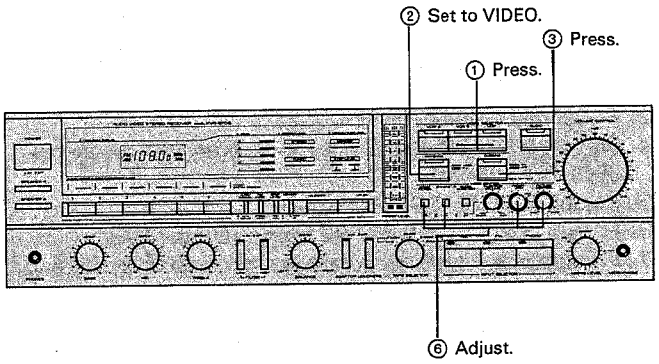
If your VCR A is equipped with an after-recording feature, an audio program source input can be added to the video tape on VCR A.

1. Press the VCR A switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the DUBBING switch.
4. Press the AUDIO INJECTION switch and set the INJECTION VOLUME to FULL AUDIO.
5. Set the TAPE SELECTOR to SOURCE.
6. To listen to tape sound, set the TAPE SELECTOR to MONI.
7. Press the AM, FM, or PHONO switch and play the program source.
8. Turn the audio dubbing switch of the VCR A ON and set the VCR A to the recording mode. The picture of VCR A and the sound of the audio source are now be recorded onto the video tape on VCR A.
9. To record the audio signal mixed with microphone sound, connect a microphone to the MICROPHONE jack and adjust the mixing level with the MIXING LEVEL control.



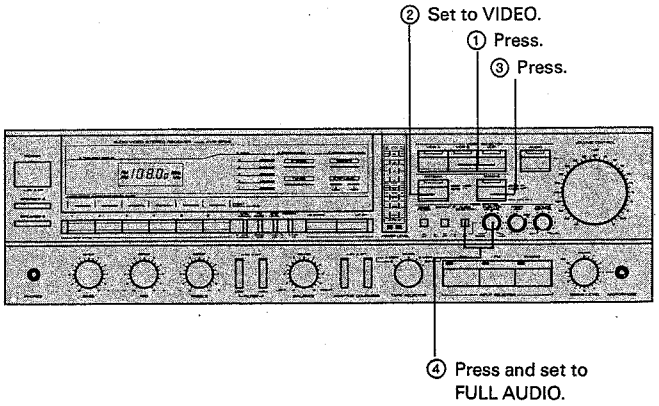
Video tape dubbing from VCR B or VDP to VCR A

1. Press the VCR B or VDP switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the DUBBING switch.
4. Follow the instruction manuals of the VCR A and VCR B or VDP for dubbing.
5. Start recording of VCR A and playback of VCR B or VDP. The dubbing starts.
6. Use the VIDEO CONTROLs (NOISE FILTER, ENHANCER, FADER and PICTURE CONTROL) to make your own personalized video tape.



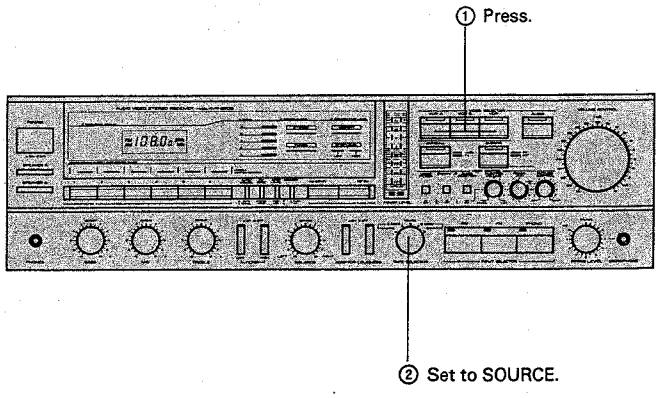
To dub from VCR B or VDP to VCR A and to insert the desired sound source into the soundtrack of the video tape copied on VCR A

1. Press the VCR B or VDP switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the DUBBING switch.
4. Press the AUDIO INJECTION switch and adjust the INJECTION VOLUME to FULL AUDIO.
5. Operate the VCR B or VDP, VCR A and audio source equipment so that the picture and the sound source are matched when dubbing is started.
6. Use the VIDEO CONTROLs (FADER and PICTURE CONTROL) to make your own personalized video tape.



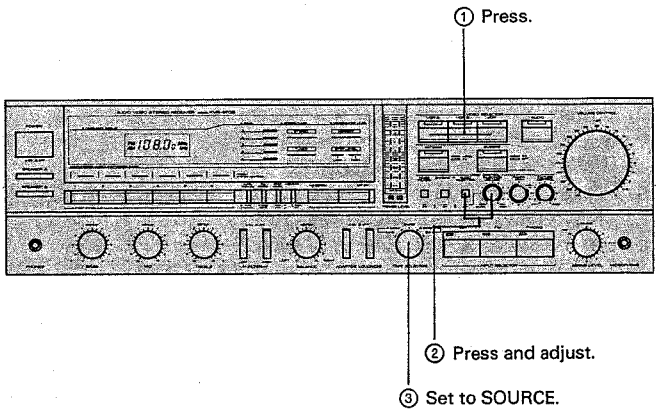
To record the video sound onto tape

1. Press the VCR A, VCR B or VDP switch.
2. Set the TAPE SELECTOR to SOURCE.
3. Play the video system and set the tape deck to the recording mode.
4. During recording, do not touch the TAPE SELECTOR, as the monitoring is not possible.



To record the video sound mixed with the audio sound onto tape

1. Press the VCR A, VCR B or VDP switch.
2. Press the AUDIO INJECTION switch and adjust the INJECTION VOLUME.
3. Set the TAPE SELECTOR to SOURCE.
4. Play the video system and audio system to be mixed and set the tape deck to the recording mode.
5. During recording, do not touch the TAPE SELECTOR, as the monitoring is not possible.

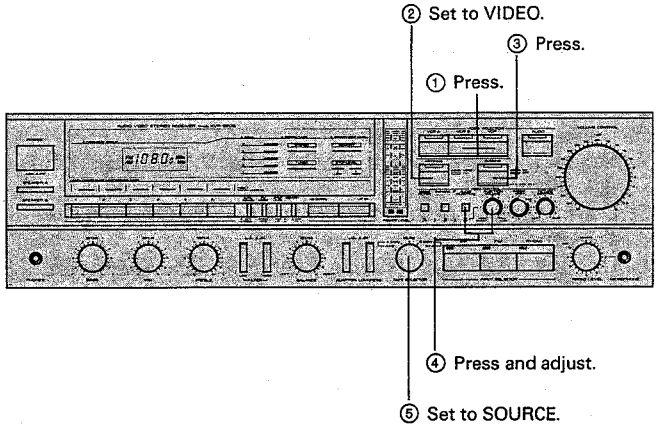


To record the video sound mixed with the tape sound onto tape

1. Press the VCR A, VCR B or VDP switch.
2. Press the AUDIO INJECTION switch and adjust the INJECTION VOLUME.
3. Set the TAPE SELECTOR to TAPE.
4. Play the video system and tape deck to be mixed and set the other tape deck to the recording mode.

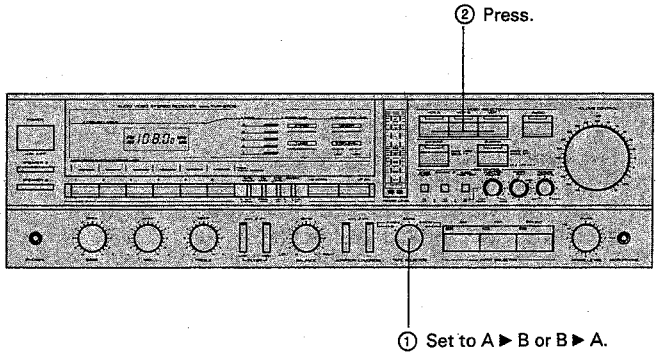
During dubbing from VCR B or VDP to VCR A, to insert the video sound mixed with audio sound

1. Press the VCR B or VDP switch.
2. Set the ANTENNA selector to VIDEO.
3. Press the DUBBING switch.
4. Press the AUDIO INJECTION switch and adjust the INJECTION VOLUME.
5. Set the TAPE SELECTOR to SOURCE.
6. For tape sound, set the TAPE SELECTOR to MONI.
7. Play the video system and audio system to be mixed and set the VCR A to recording mode.



To play VCR A while dubbing with two tape decks

1. Set the TAPE SELECTOR to the appropriate dubbing position (A ▶ B or B ▶ A).
2. Press VCR A, VCR B or VDP switch.
3. Play back the tape deck and copy the tape with the tape decks.
4. Operate the VCR A for playback.

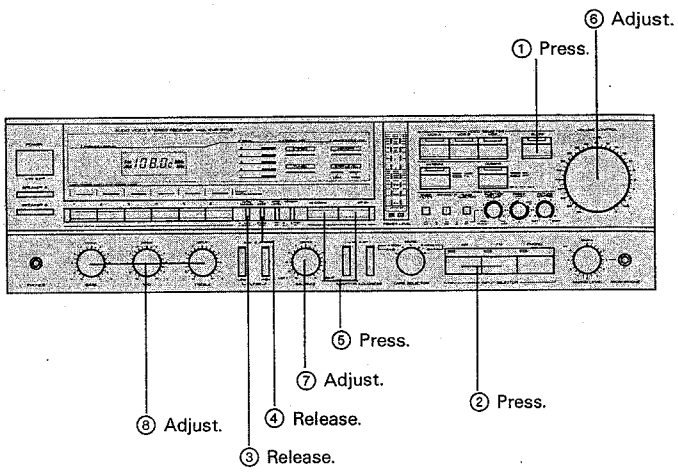


Audio section

AM/FM broadcasting reception

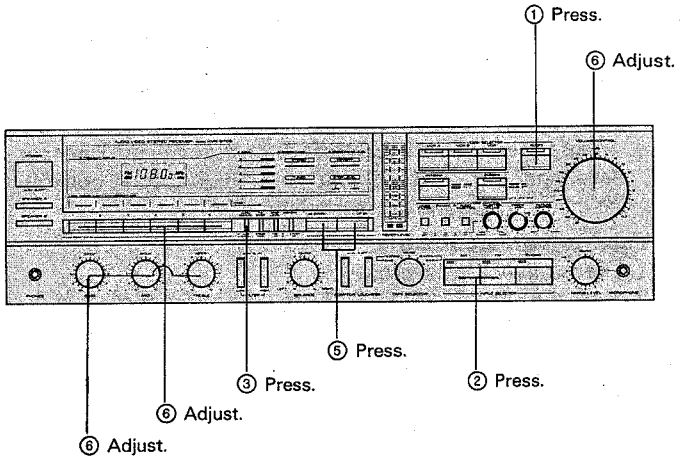
Auto tuning

1. Press the AUDIO switch.
2. Press the AM or FM switch for AM or FM reception.
3. Set the AUTO/MANUAL switch to AUTO (unlatched).
4. Set the FM MODE switch to STEREO.
   To receive only strong stations, set the STOP LEVEL switch to HIGH.
5. Press the UP (▶) or DOWN (◀) switch to start the tuning system in the direction of the desired station. Release when the frequency display shows that you are approaching your station. The auto tuning will stop automatically when the stations is received, and the frequency display will show the channel frequency. If the auto tuning stops at an unwanted station before it reaches the desired station, press the UP (▶) or DOWN (◀) switch again.
6. Adjust the VOLUME CONTROL to the desired listening level.
7. Adjust the balance of the left and right channels.
8. Use the BASS, MID and TREBLE tone controls to adjust the sound as your preference, as well as the acoustic conditions of the room.



Manual tuning

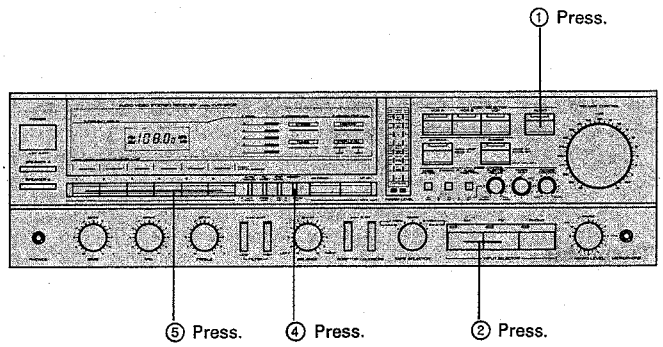
1. Press the AUDIO switch.
2. Press the AM or FM switch for AM or FM reception.
3. Set the AUTO/MANUAL switch to MANUAL.
4. To receive a weak FM broadcast, set the FM MODE switch to MONO. The muting will be released in FM mode.
5. Press the UP (▶) or DOWN (◀) switch to start the tuning system in the direction of the desired station.
   Release when the frequency display shows your station.
   If the tuning does not stop at your station, tap the UP (▶) or DOWN (◀) switch.
6. Adjust the VOLUME CONTROL to the desired listening level and use the BASS, MID and TREBLE tone controls to adjust the sound to suit your own taste.



Preset procedures

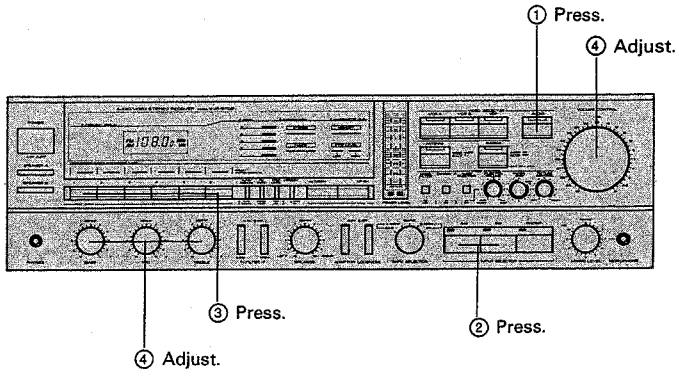
Up to 6 stations of each AM and FM band can be preset.

1. Press the AUDIO switch.
2. Press the AM or FM switch for AM or FM reception.
3. With the auto or manual tuning, tune the unit to the desired station.
4. Press the MEMORY switch.
5. Press one of the PRESET STATION switches within 5 seconds after the MEMORY switch is pressed.



Preset tuning

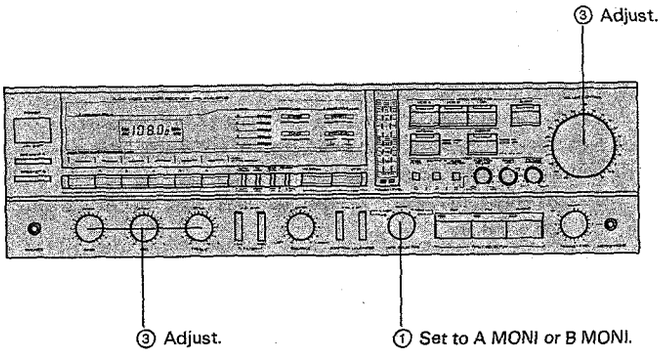
1. Press the AUDIO switch.
2. Press the AM or FM switch for AM or FM reception.
3. Press the PRESET STATION switch for the desired station.
4. Adjust the VOLUME CONTROL to the desired listening level and use the BASS, MID and TREBLE tone controls to adjust the sound as your preference.



Tape decks

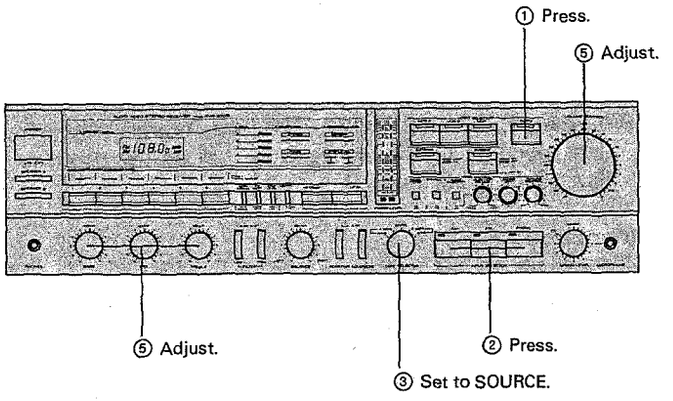
Tape playback

1. Set the TAPE SELECTOR to the appropriate monitor position (A MONI or B MONI).
2. Operate the tape deck.
3. Adjust the VOLUME CONTROL to the desired listening level and use the BASS, MID and TREBLE tone controls to adjust the sound as your preference.



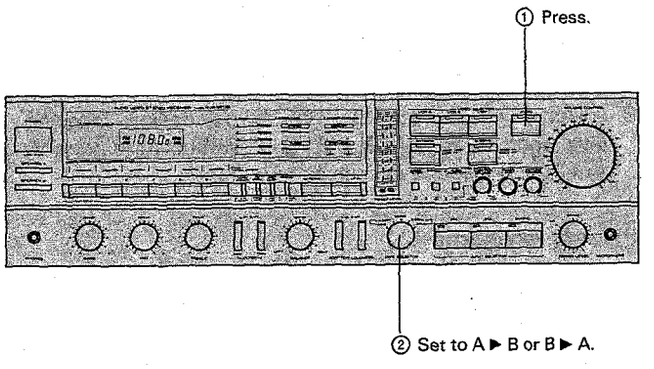
Recording

1. Press the AUDIO switch.
2. Set the AM, FM or PHONO switch to select the desired program source.
3. Set the TAPE SELECTOR to SOURCE.
   To monitor the recording, set the TAPE SELECTOR switch to the appropriate monitor position (A MONI or B MONI). During recording, do not touch the TAPE SELECTOR.
4. Set up your tape deck for recording and set the recording levels with the controls on your tape deck. The VOLUME CONTROL and BASS, MID and TREBLE tone controls on the receiver do not affect the signal applied to the tape deck for recording purposes.
5. Adjust the VOLUME CONTROL to the desired listening level and use the BASS, MID and TREBLE tone controls to adjust the sound as your preference.



Tape-to-tape-dubbing

1. Press the AUDIO switch.
2. Set the TAPE SELECTOR to the appropriate dubbing position (A ▶ B or B ▶ A).
3. Operate the tape deck for playback and the tape deck for recording.
4. Adjust the recording level control of the recording tape deck for the optimum recording levels.

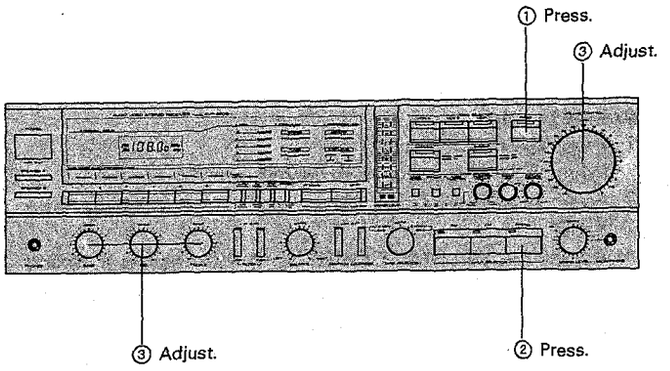


Tape monitoring

If the recording tape deck is equipped with three heads, you can compare the sound quality of the recording in progress with that of the source material.

Turntable

1. Press the AUDIO switch.
2. Press the PHONO switch.
3. Operate the turntable.
4. Adjust the VOLUME CONTROL to the desired listening level and use the BASS, MID and TREBLE tone controls to adjust the sound as your preference.



In case of difficulty

If your receiver does not operate as expected, the cause may be some error in system connections or control settings. Consult the table below to see if the problem can be corrected. If trouble persists, consult your dealer or service representative.

During operation involved in video	Cause	Remedy
No picture on TV.	a) No VIDEO SELECTOR switch used. b) One of the VIDEO SELECTOR switches pressed to which no audio or video unit is connected.	Press the appropriate VIDEO SELECTOR switch.
TV programs cannot be received.	a) The antenna cable disconnected. b) The TV switch not pressed.	a) Connect the antenna cable firmly. b) Press the TV switch.
The video tape being played back and the TV program are mixed.	The TV program selector not set to the vacant channel.	Set the TV program selector to the vacant channel 3 or 4.
When the video deck is played back, the sound is output from the left or right speaker. In the recording mode, the audio signal is not recorded.	The MODE switches on the rear panel of this unit set to STEREO.	Set the switches to MONO.
Stereo source signals are reproduced in mono.	The MODE switches set to MONO.	Set the switches to STEREO.
When the INPUT SELECTOR switch setting of this unit is changed, the picture on the TV screen becomes unstable.	The vertical or horizontal hold adjustment of the picture not properly set.	Adjust the vertical or horizontal hold control of the TV set to make the picture stable.
When audio dubbing is done to a video tape on VCR A, unexpected signals are recorded on the tape.	The input selector switch of VCR A set to TV (TUNER).	Set the input selector switch to LINE (AUX).
AM, FM, phono or tape playback	**Cause**	**Remedy**
No sound although AC is switched ON.	Poor AC plug connection.	Check AC plug connection. Make sure AC outlet inactive.
No sound from left and right.	a) Speaker cords disconnected. b) VOLUME CONTROL set fully counter-clockwise. c) TAPE SELECTOR switch set to monitor. d) The AUDIO switch is not pressed.	a) Check speaker connections. b) Set to appropriate volume level. c) Always set to SOURCE except when using tape decks. d) Press the switch.
Sound from one side only.	a) Poor speaker cord connections. b) BALANCE control set to one extreme.	a) Check speaker connections. b) Adjust BALANCE control.
During phono playback only	**Cause**	**Remedy**
No sound from left and right, or sound only from one side.	Turntable output cord disconnected.	See that turntable output cord is firmly plugged in.
Loud hum drowns out sound.	Poor turntable output cord plugshell connections.	See that plugs are inserted fully so that outer shells make contact.
Sound audible but background hum occurs.	a) Turntable output cord picking up hum from AC cord. b) Turntable not grounded.	a) Keep turntable output cord away from AC cords. Choose cord paths which keep hum at a minimum. Reverse turntable AC plug connections. b) Connect ground wire to GND terminal.
Sound audible but continuous background buzz interferes.	TV signal picked up by turntable output cord. Frequently occurs near TV transmitting antenna.	Route turntable cord so that hum is minimized.
Howling noise occurs when volume is raised or bass response is increased.	Speaker vibrations induce feedback in pick-up.	Increase distance between turntable and speakers. Choose speaker locations carefully.

Specifications

Audio section

Continuous Average Power Output
100 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.008% total harmonic distortion.

Both Channel Driven	
into 8 ohms at 1,000Hz	110W + 110W
into 4 ohms at 1,000Hz	110W + 110W
Dynamic Power Output	
at 4 ohms	320W
Total Harmonic Distortion	
at Rated Output, 20 Hz –20,000 Hz	0.008%
at 1 watt Output, 20 Hz –20,000 Hz	0.005%
Intermodulation Distortion	
(60 Hz : 7 kHz = 4 : 1)	
at Rated Output into 8 ohms	0.008%
Slew Rate	±120V/μs
Rise Time	1.5μs
Frequency Response	
PHONO (RIAA)	30 Hz – 20,000 Hz, ±0.3 dB
TAPE	7 Hz – 120,000 Hz, +0, –3 dB
Power Amp (ADP IN)	DC ~ 200,000 Hz, +0, –3 dB
Signal-to-Noise Ratio (IHF-A)	
PHONO (MM) at 2.5 mV Input	86 dB
PHONO (MM) at 5.0 mV Input	92 dB
TAPE	101 dB
MIC	70 dB
Tone Control	
BASS	±12 dB at 100 Hz
MID	±12 dB at 1 kHz
TREBLE	±12 dB at 10 kHz
Low Filter	6 dB/oct at 18 Hz
High Filter	6 dB/oct at 5 kHz
Loudness Control	
(at –30 dB VOLUME level)	+10 dB at 100Hz
Damping Factor	
1,000 Hz, 8 ohms	40
Input Sensitivity/Impedance (at Rated Output)	
PHONO (MM)	2.5 mV/50 kohms
TAPE	150 mV/50 kohms
MIC	2.0 mV/50 kohms
Phono Maximum Input Level	
PHONO (MM) at 1,000 Hz, 0.008% THD	200 mV
Output Level/Impedance	
TAPE REC	150 mV/2 kohms
ADP OUT	1V/1 kohm

Video section

Video Input Sensitivity/Impedance	
VCR A, VCR B, VDP	1.0 Vp-p/75 ohms unbalanced
Video Output Level/Impedance	
VIDEO OUT, VCR A REC (Pin)	1.0 Vp-p/75 ohms unbalanced
Signal-to-Noise Ratio (Video Signal)	
VCR A, VCR B, VDP → VIDEO OUT	62 dB
Frequency Response (Video Signal)	
VCR A, VCR B, VDP → VIDEO OUT	6.5 Hz – 10 MHz, ±2.0 dB
Audio Input Sensitivity/Impedance	
VCR A, VCR B, VDP	–6 dBs/50 kohms unbalanced
Audio Output Level	
VCR A REC (Pin)	–20 dBs/50 kohms unbalanced
Signal-to-Noise Ratio (IHF-A)	
VCR B, VDP → VCR A REC (Pin)	100 dB
VCR A, VCR B, VDP → SPEAKER	82 dB
Frequency Response	
VCR B, VDP → VCR A REC (Pin)	18 Hz – 350 KHz, –3 dB
VCR A, VCR B, VDP → SPEAKER	18 Hz – 120 KHz, –3 dB
VHF Output Signal	Channel 3 or 4 switchable

FM Tuner section

Tuning Frequency Range	87.5 MHz – 108 MHz
Sensitivity	
Usable Sensitivity (IHF):	
MONO	1.9 μV (10.8 dBf)
50 dB Quieting Sensitivity (IHF):	
MONO	2.8 μV (14.2 dBf)
STEREO	38 μV (36.8 dBf)
Total Harmonic Distortion	
MONO at 1,000Hz	0.07%
STEREO at 1,000 Hz	0.08%
Signal-to-Noise Ratio	
MONO	80 dB
STEREO	74 dB
Capture Ratio	1.5 dB
Alternate Channel Selectivity	
(IHF ±400 kHz)	60 dB
Stereo Separation	
1,000 Hz	50 dB
50 Hz – 10,000 Hz	40 dB
Frequency Response	30 Hz – 15,000 Hz, +0.5, –2.0 dB
Image Rejection Ratio	80 dB
IF Rejection Ratio	95 dB
Spurious Response Ratio	95 dB
AM Suppression Ratio	60 dB
Sub-Carrier Suppression Ratio	67 dB

AM Tuner section

Tuning Frequency Range; MW	520 kHz – 1,610 kHz
Usable Sensitivity	10 μV (400 μV/m)
Signal-to-Noise Ratio	48 dB
Image Rejection Ratio	40 dB
Selectivity	25 dB

General

Power Requirement	120-220-240 V (switchable), 50/60 Hz
Power Consumption	550W at full Power 50W at no signal
AC Outlet	Switched x 2: total 200W Unswitched x 1: 200W
Dimensions	W: 550 mm (21-21/32") H: 165 mm (6-1/2") D: 405 mm (15-31/32")
Weight (Net)	13.3 kg (29.3 lb)
Accessories	F-Connector Cable x 1 Feeder antenna x 1

Note:
We follow a policy of continuous advancements in development. For this reason specifications may be changed without notice.